IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

In re Patent Application of: Atty Dkt. JAR-1035-510
C# M#

MIYACHI TC/A.U.: 2871

Serial No. 10/849,378 Examiner: Chien, Lucy P.

Filed: May 20, 2004 Date: November 19, 2007

Title: LIQUID CRYSTAL DISPLAY DEVICE

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

☐ **Correspondence Address Indication Form Attached.**

☐ **NOTICE OF APPEAL**
Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the Examiner twice/finally rejecting applicant's claim(s). $510.00 (1401)/$255.00 (2401) $

☒ An appeal **BRIEF** is attached in the pending appeal of the above-identified application $510.00 (1402)/$255.00 (2402) $ 510.00

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☐ A reply brief is attached. **(no fee)**

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Any future submission requiring an extension of time is hereby stated to include a petition for such time extension. The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our **Account No. 14-1140.** A duplicate copy of this sheet is attached.

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NIXON & VANDERHYE P.C.
By Atty: Joseph A. Rhoa, Reg. No. 37,515

Signature: _____

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APPEAL BRIEF

Sir:

Appellant hereby appeals to the Board of Patent Appeals and Interferences from the last decision of the Examiner.

TABLE OF CONTENTS

(I) REAL PARTY IN INTEREST

The real party in interest is Sharp Kabushiki Kaisha, a corporation of the country of Japan.

(II) RELATED APPEALS AND INTERFERENCES

The appellant, the undersigned, and the assignee are not aware of any related appeals, interferences, or judicial proceedings (past or present), which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

(III) STATUS OF CLAIMS

Claims 1-13 and 15-40 are pending and have been rejected. Claim 14 has been cancelled. No claims have been substantively allowed. Claims 1-13 and 15-40 are on appeal herein.

(IV) STATUS OF AMENDMENTS

No amendments have been filed since the date of the Final Rejection.

(V) SUMMARY OF CLAIMED SUBJECT MATTER

This section is for purposes of example only and is without limitation on the scope of the claims.

Claim 1 relates to liquid crystal device (e.g., pg. 11, lines 12-17) comprising: a pair of substrates (e.g., see 1 and 2 in Fig. 1; pg. 18, lines 12-17) respectively having electrodes (e.g., see 12 and 22 in Fig. 1; pg. 19, lines 14-24) on opposing surfaces, the pair of substrates sandwiching a liquid crystal layer (e.g., see 3 in Fig. 1; pg. 18, lines 15-18), a plurality of domains being formed within a display region when a voltage is applied to the electrodes (e.g., Fig. 1(b); pg. 11, line 29 to pg. 12, line 3), the plurality of domains being such that liquid crystal molecules are aligned in different directions from domain to domain (e.g., pg. 12, line 3; Fig. 1(b)), at least one of the electrodes on the pair of substrates having an aperture section (e.g., see 12a in Fig. 2; pg. 20, lines 9-23), a protrusion section (e.g., see 23 in Fig. 2; pg. 20, last two lines, to pg. 21, line 11) extending across the liquid crystal layer and which connects the electrodes, and wherein the aperture section and the protrusion section are bent in such a manner that sides of the aperture section and sides of the protrusion section each extend in directions which respectively form about 45° with a long side and a short side of the display region (e.g., see Fig. 2; pg. 20, last two lines, to pg. 21, line 11; pg. 22, lines 7-19) and wherein bent parts of the aperture section and bent parts of the protrusion section are discontinuous (e.g., see Fig. 2; pg. 21, line 5), and wherein the bent parts of the protrusion section are located in regions corresponding to solid portions of the electrodes (e.g., see Fig. 2). For example and without limitation, Fig. 2 of the instant application illustrates that the aperture section (slits) 12a and the protrusion section 23 are bent in such a manner that

sides of the aperture section 12a and sides of the protrusion section 23 each extend in directions which respectively form about 45° with a long side and a short side of the display region, and that bent parts of the aperture section 12a and bent parts of the protrusion section 23 are discontinuous.

Claim 24 relates to a liquid crystal display device (e.g., pg. 11, lines 12-17) comprising: a pair of substrates (e.g., see 1 and 2 in Fig. 1; pg. 18, lines 12-17) respectively having electrodes on opposing surfaces (e.g., see 12 and 22 in Fig. 1; pg. 19, lines 14-24), the pair of substrates sandwiching at least a liquid crystal layer therebetween (e.g., see 3 in Fig. 1; pg. 18, lines 15-18), a plurality of domains formed within a display region when a voltage is applied to the electrodes (e.g., Fig. 1(b); pg. 11, line 29 to pg. 12, line 3), the plurality of domains being such that liquid crystal molecules are aligned in different directions from domain to domain (e.g., pg. 12, line 3; Fig. 1(b)), at least one of the electrodes having an aperture section (e.g., see 12a in Fig. 2; pg. 20, lines 9-23), a protrusion section (e.g., see 23 in Fig. 2; pg. 20, last two lines, to pg. 21, line 11) that extends across the liquid crystal layer and which connects the electrodes, and wherein the protrusion section is bent in such a manner that sides of the protrusion section extend in directions which respectively form about 45° with a long side and a short side of the display region (e.g., see Fig. 2; pg. 20, last two lines, to pg. 21, line 11; pg. 22, lines 7-19), and wherein bent parts of the protrusion section are discontinuous, and wherein the bent parts of the protrusion section are located in regions corresponding to solid portions of the electrodes (e.g., see Fig. 2).

(VI) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

First, whether claims 1-7, 9-13, 15-30 and 32-40 are unpatentable under 35 U.S.C. Section 103(a) over Kim 1 (US 6,774,967) in view of Kim 2 (US 6,356,335).

Second, whether claims 8 and 31 are unpatentable under 35 U.S.C. Section 103(a) over Kim 1 (US 6,774,967) in view of Kim 2 (US 6,356,335) as applied to claim 1, and further in view of Takeda (US 6,724,452).

(VII) ARGUMENT

It is axiomatic that in order for a reference to anticipate a claim, it must disclose, teach or suggest each and every feature recited in the claim. See, e.g., *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983). The USPTO has the burden in this respect.

Moreover, the USPTO has the burden under 35 U.S.C. Section 103 of establishing a *prima facie* case of obviousness. *In re Piasecki*, 745, F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). It can satisfy this burden only by showing that some objective teaching in the prior art, or that knowledge generally available to one of ordinary skill in the art, would have led that individual to combine the relevant teachings of the references to arrive at the claimed invention. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Before the USPTO may combine the disclosures of the references in order to establish a *prima facie* case of obviousness, there must be some suggestion or rationale for doing so. *In re Jones*, 958 F.2d 347 (Fed. Cir. 1992). Even assuming, *arguendo*, that a given combination of references is proper, the combination of references must in any event disclose the features of the claimed invention in order to render it obvious.

Furthermore, with respect to the inherency rejections, the law is clear that for something to be "inherent" in a reference, it must "necessarily" be present. *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). The fact that a certain result or characteristic "may" occur or be present in the prior art is not sufficient to establish the inherence of that result of characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). The Board of Appeals has made clear

that "[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

(i) Whether claims 1-7, 9-13, 15-30 and 32-40 are unpatentable under§103(a) over Kim 1 in view of Kim 2

Claims 1-7, 9-13, 15-30 and 32-40 stand rejected under 35 U.S.C. Section 103(a) over Kim 1 (US 6,774,967) in view of Kim 2 (US 6,356,335). This Section 103(a) rejection should be reversed for at least the following reasons.

Claim 1 requires that "the *aperture section and the protrusion section are bent in such a manner that sides of the aperture section and sides of the protrusion section each extend in directions which respectively form about 45° with a long side and a short side of the display region*, and wherein *bent parts of the aperture section and bent parts of the protrusion section are discontinuous*, and wherein the bent parts of the protrusion section are located in regions corresponding to solid portions of the electrodes." For example and without limitation, Fig. 2 of the instant application illustrates that the aperture section (slits) 12a and the protrusion section 23 are bent in such a manner that sides of the aperture section 12a and sides of the protrusion section 23 each extend in directions which respectively form about 45° with a long side and a short side of the display region, and that bent parts of the aperture section 12a and bent parts of the protrusion section 23 are discontinuous.

Fig. 14 of Kim 1 illustrates slits 51 and protrusions 53. However, the protrusions 53 are continuous (not "discontinuous" as required by claim 1). The Examiner cites to

Fig. 8E of Kim 2 (which discloses discontinuous protrusions 57) and contends that it would have been obvious to have made the protrusions 53 in Fig. 14 of Kim 1 discontinuous. This contention is incorrect. The only reason why the protrusions 57 in Fig. 8E of Kim 2 are discontinuous is due to the presence of a slit 43 therebetween which prevents them from being connected. The protrusions 57 in Fig. 8E of Kim 2 work together with the slits 43 and rubbing films in order to form particular types of domains which are entirely different than the domains of Kim 1. Because Fig. 14 of Kim 1 does not have a slit or aperture at the apex of the protrusion 53, one of ordinary skill in the art would not have applied the discontinuous feature of Kim 2 thereto. There is simply no reason why one of ordinary skill in the art would have made the protrusion 53 in Fig. 14 of Kim 1 discontinuous. The alleged modification is illogical and unreasonable. Moreover, given that the aperture 51 is continuous at its apex (due to the gap between pixels) adjacent the apex of the protrusion 53, one of ordinary skill in the art would not have made the apex of the protrusion 53 discontinuous because this would destroy the domain alignment in the apex area – one of ordinary skill would not modify Fig. 14 of Kim 1 as alleged in the Office Action because this would result in bad performance and a destroyed domain area. In this respect, one of ordinary skill would not have modified Kim 1 in a manner which would destroy the functionality and/or operation of the device as alleged in the Office Action.

Furthermore, the protrusions 57 in Fig. 8E of Kim 2 are not formed to be discontinuous for some purpose. The protrusions are formed to be discontinuous only because a slit 43 prevents them from being connected. This is clear from other drawings (e.g., Figs. 7A to 7G and Figs. 8A to 8D, 8G, 8J, and 8M) of Kim 2. In Kim 2 the

protrusions 57 are formed to be discontinuous only when the slit 43 prevents them from being connected. Therefore, there would have been no reason or incentive for a person skilled in the art to make the protrusion 53 of Kim 1 discontinuous in view of the protrusions 57 of Kim 2 which were discontinuous due to the prevention of the slit 43. Further, in consideration of the disclosure of Kim 2, a person skilled in the art could not have conceived that some effect could be obtained by making the protrusion 53 of Kim 1 discontinuous. It is clear that a person skilled in the art could not have conceived the structure of the invention of claim 1 based on the disclosures of Kim 1 and Kim 2.

The Section 103(a) combination applied to claim 24 is incorrect in a similar manner. Claim 24 requires that "the protrusion section is bent in such a manner that sides of the protrusion section extend in directions which respectively form about 45° with a long side and a short side of the display region, and wherein bent parts of the protrusion section are *discontinuous*, and wherein the bent parts of the protrusion section are located in regions corresponding to solid portions of the electrodes." In other words, claim 24 defines over the cited art in a similar manner as that discussed above in connection with claim 1.

(ii) Whether claims 8 and 31 are unpatentable under§103(a) over Kim 1 in view of Kim 2 as applied to claim 1, and further in view of Takeda

Claims 8 and 31 (which depend from claims 1 and 24, respectively) are allowable over the cited art because independent claims 1 and 24, from which they depend, define over the cited art for the reasons discussed above.

CONCLUSION

In conclusion it is believed that the application is in clear condition for allowance; therefore, early reversal of the Final Rejection and passage of the subject application to issue are earnestly solicited.

Respectfully submitted,

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(VIII) CLAIMS APPENDIX

1. A liquid crystal device, comprising:

a pair of substrates respectively having electrodes on opposing surfaces, the pair of substrates sandwiching a liquid crystal layer,

a plurality of domains being formed within a display region when a voltage is applied to the electrodes, the plurality of domains being such that liquid crystal molecules are aligned in different directions from domain to domain,

at least one of the electrodes on the pair of substrates having an aperture section,

a protrusion section extending across the liquid crystal layer and which connects the electrodes, and

wherein the aperture section and the protrusion section are bent in such a manner that sides of the aperture section and sides of the protrusion section each extend in directions which respectively form about 45° with a long side and a short side of the display region, and wherein bent parts of the aperture section and bent parts of the protrusion section are discontinuous, and wherein the bent parts of the protrusion section are located in regions corresponding to solid portions of the electrodes.

2. The liquid crystal device as set forth in claim 1, wherein: at least one of the electrodes has a protrusion as the protrusion section within the display region; and a height of the protrusion is identical to a thickness of the liquid crystal layer.

3. The liquid crystal device as set forth in claim 2, wherein: the protrusion is provided to only one of the electrodes on the pair of substrates.

4. The liquid crystal device as set forth in claim 2, wherein: the protrusion is provided to the electrode which opposes the electrode having the aperture section.

5. The liquid crystal device as set forth in claim 1, wherein: there are domain boundaries at the protrusion section and at the aperture section, the domain boundaries being boundaries between the domains in which the liquid crystal molecules are aligned in different directions from domain to domain.

6. The liquid crystal device as set forth in claim 1, wherein: the protrusion section is provided outside a region where, in a two-dimensional view, the aperture section is provided.

7. The liquid crystal device as set forth in claim 1, wherein: the protrusion section is made of dielectric material.

8. The liquid crystal device as set forth in claim 1, wherein: the protrusion section is made of light-shielding material.

9. The liquid crystal device as set forth in claim 1, wherein: the liquid crystal layer has negative dielectric anisotropy; and

the liquid crystal molecules are initially aligned vertically with respect to the electrodes.

10. The liquid crystal device as set forth in claim 1, wherein: a surface of the protrusion section is subjected to an alignment process which is different from an alignment process of regions other than the surface of the protrusion section.

11. The liquid crystal device as set forth in claim 1, wherein: a surface of the protrusion section is subjected to a horizontal alignment process so that the liquid crystal molecules are initially aligned in parallel with the surface of the protrusion section.

12. The liquid crystal device as set forth in claim 1, wherein: an alignment film is provided to the display region of the pair of substrates, whereas no alignment film is provided to a surface of the protrusion section.

13. The liquid crystal device as set forth in claim 1, wherein: the protrusion section is tilted with respect to a thickness direction of the pair of substrates.

15. The liquid crystal device as set forth in claim 1, wherein: the protrusion section is provided in parallel with the aperture section.

16. The liquid crystal device of claim 1, wherein the protrusion section is substantially V-shaped.

17. The liquid crystal device of claim 1, wherein the aperture section is substantially V-shaped in the electrode in which the aperture section is formed.

18. The liquid crystal device of claim 1, wherein the protrusion section and the aperture section are substantially V-shaped.

19. The liquid crystal device of claim 1, wherein the aperture section includes one or more apertures defined in a pixel electrode.

20. The liquid crystal device of claim 1, wherein the protrusion section includes one or more protrusions which extends from an electrode of one of the substrates to an electrode of the other of the substrates.

21. The liquid crystal device of claim 1, wherein the liquid crystal layer has a negative dielectric anisotropy.

22. The liquid crystal device as set forth in claim 1, wherein the protrusion section is substantially parallel to the aperture section.

23. The liquid crystal device as set forth in claim 1, wherein the protrusion section extends across the liquid crystal layer, and is made of a different material than is the liquid crystal.

24. A liquid crystal display device comprising:

a pair of substrates respectively having electrodes on opposing surfaces, the pair of substrates sandwiching at least a liquid crystal layer therebetween,

a plurality of domains formed within a display region when a voltage is applied to the electrodes, the plurality of domains being such that liquid crystal molecules are aligned in different directions from domain to domain,

at least one of the electrodes having an aperture section,

a protrusion section that extends across the liquid crystal layer and which connects the electrodes, and

wherein the protrusion section is bent in such a manner that sides of the protrusion section extend in directions which respectively form about 45° with a long side and a short side of the display region, and wherein bent parts of the protrusion section are discontinuous, and wherein the bent parts of the protrusion section are located in regions corresponding to solid portions of the electrodes.

25. The liquid crystal display device as set forth in claim 24, wherein at least one of the electrodes has a protrusion as the protrusion section within the display region; and a height of the protrusion is identical to a thickness of the liquid crystal layer.

26. The liquid crystal display device as set forth in claim 25, wherein the protrusion is provided for only one of the electrodes on the pair of substrates.

27 The liquid crystal display device as set forth in claim 25, wherein the protrusion is provided to the electrode which opposes the electrode having the aperture section.

28. The liquid crystal display device as set forth in claim 24, wherein there are domain boundaries at the protrusion section and at the aperture section, the domain boundaries being boundaries between the domains in which the liquid crystal molecules are aligned in different directions from domain to domain.

29. The liquid crystal display device as set forth in claim 24, wherein the protrusion section is provided outside a region where, in a two-dimensional view, the aperture section is provided.

30 The liquid crystal display device as set forth in claim 24, wherein the protrusion section is made of dielectric material.

31. The liquid crystal display device as set forth in claim 24, wherein the protrusion section is made of light-shielding material.

32. The liquid crystal display device as set forth in claim 24, wherein the liquid crystal layer has negative dielectric anisotropy; and

the liquid crystal molecules are initially aligned substantially vertically with respect to the electrodes.

33. The liquid crystal display device as set forth in claim 24, wherein a surface of the protrusion section is subjected to an alignment process which is different from an alignment process of regions other than the surface of the protrusion section.

34. The liquid crystal display device as set forth in claim 24, wherein a surface of the protrusion section is subjected to a horizontal alignment process so that the liquid crystal molecules are initially aligned in parallel with the surface of the protrusion section.

35. The liquid crystal display device as set forth in claim 24, wherein an alignment film is provided in at least the display region of the pair of substrates, whereas no alignment film is provided on a surface of the protrusion section.

36. The liquid crystal display device as set forth in claim 24, wherein the protrusion section is tilted with respect to a thickness direction of the pair of substrates.

37. The liquid crystal display device as set forth in claim 24, wherein the protrusion section is substantially parallel to the aperture section.

38. The liquid crystal display device of claim 24, wherein the protrusion section is substantially V-shaped.

39. The liquid crystal display device of claim 24, wherein the aperture section is substantially V-shaped.

40. The liquid crystal display device of claim 24, wherein the aperture section includes one or more apertures defined in a pixel electrode.

(IX) EVIDENCE APPENDIX

None

(X) RELATED PROCEEDINGS APPENDIX

None